

SUMMARY

OF THE

IMPROVEMENTS AND DISCOVERIES

IN THE

MEDICAL SCIENCES.

ANATOMY AND PHYSIOLOGY.

1. *Abstract of Mr. Goodsir's paper on the Ultimate Secreting Structure, and on the laws of its Function.* (Read at the Royal Society of Edinburgh on the 30th March, 1842.) After referring to the labours of those anatomists who had verified Malpighi's doctrine of the follicular nature of gland ducts, the author alluded to Parkinje's hypothesis of the secreting function of the nucleated corpuscles which line these ducts. In a rapid sketch of the results of inquiries since the appearance of Müller's work "*De Penitiore Structura Glandularum*," and more particularly of the observations of Henle and others on the closed vesicles which are situated at the extremities of certain ducts, Mr. Goodsir stated, that no anatomist had hitherto "proved that secretion takes place within the primitive nucleated cell itself, or had pointed out the intimate nature of the changes which go on in a secreting organ during the performance of its function."

Numerous examples were now given of secretions detected in the cavities of nucleated cells of various glands and secreting surface. Among these secretions were the ink of the cephalopoda and the purple of *janthina* and *aplysia*; bile in an extensive series selected from the principal divisions of the animal kingdom; urine in the mollusk; milk, &c.

The wall is believed by the author to be the part of the cell engaged in the process of secretion. The cavity contains the secreted substance, and the nucleus is the reproductive organ of the cell. A primitive cell engaged in secretion is denominated, by the author, a primary secreting cell; and each cell of this kind is endowed with its own peculiar property, according to the organ in which it is situated. The discovery of the secreting agency of the primitive cell does not remove the principal mystery in which the function has always been involved; but the general fact that the primitive cell is the ultimate secreting structure, is of great value in physiological science, inasmuch as it connects secretion with growth as functions regulated by the same laws, and explains one of the greatest difficulties in physiology, viz. why a secretion flows from the free surface only of a secreting membrane—the secretion exists only on the free surface inclosed in the ripe cells which constitute that surface.

The author then proceeded to the consideration of the origin, the development, and the disappearance of the primary secreting cell, a subject which necessarily involved the description of the various minute arrangements of glands, and other secreting organs. After describing the changes which occur in the testicle of the *squalus cornubicus*, when the organ is in a state of functional activity, and in the liver of *carcinus mænas*, it was stated that these were selected as examples of two orders of glands, denominated by the author vesicular and follicular. The changes which occur in the first order of glands consist in the formation and disappearance of closed vesicles or acini. Each acinus might be first a single cell, denominated by the author the *primary* or *germinal* cell; or,

secondly, of two or more cells enclosed in the primary cell, and produced from its nucleus. The enclosed cells he denominates the secondary cells of the acinus, and in the cavities of these, between their nuclei and cell walls, the peculiar secretion of the gland is contained. The primary cell, with its included group of cells, each full of secretion, is appended to the extremity of one of the terminal ducts, and consequently does not communicate with that duct, a diaphragm formed by a portion of the primary cell wall stretching across the pedicle. When the secretion in the group of included cells is fully elaborated, the diaphragm dissolves or gives way, the cells burst, and the secretion flows along the ducts, the acinus disappearing, and making room for a neighbouring acinus, which has in the mean time been advancing in a similar manner. The whole parenchyma of glands of this order is thus, according to Mr. Goodsir, in a constant state of change—of development, maturity, and atrophy,—this series of changes being directly proportional to the profuseness of the secretion.

In the second order of glands, the follicular, as exemplified in the liver of *carcinus*, the germinal cell or spot is situated at the blind extremity of the follicle, and the secreting cells, as they advance along the follicle, become distended with their peculiar secretion.

Among other general conclusions deducible from these observations, it appeared that ducts are to be considered as inter-cellular passages into which the secretions formed by cells are cast.

Finally, the author inferred from the whole inquiry, 1st, That secretion is a function of, and takes place within the nucleated cell; and, 2d, Growth and secretion are identical,—the same process under different circumstances.—*Lon. and Edin. Monthly Journ. Med. Sci.*, May, 1842.

2. *Structure of the human kidney and the changes it undergoes in the granular degeneration.*—Mr. GOODSIR submitted to the Medico-Chirurgical Society of Edinburgh April 6th, 1842, the result of his researches into the structure of the healthy human kidney, and into the changes which it undergoes in the granular degeneration described by Dr. Bright. Without denying the existence of occasional blind extremities of the tubuli uriniferi, the result probably of arrested development, the author stated that he had never seen the ducts terminating in this way. He then described a structure, which appears hitherto to have been overlooked by anatomists, namely, a fibro-cellular framework, which pervading every part of the gland, and particularly its cortical portion, performs the same important part in the kidney, which the capsule of Glisson does in the liver, forming a basis of support to the delicate structure of the gland, conducting the blood-vessels through the organ, and forming small chambers in the cortical portion, in each of which a single ultimate coil or loop of the uriniferous ducts is lodged. Mr. Goodsir believes, that the urine is formed at first within the so-called epithelium cells of the ducts, and that these burst, dissolve, and throw out their contents, and are succeeded by others which perform the same functions. The urine of man has not been detected by the author within the cells which line the ducts, but he has submitted to the Royal Society of Edinburgh, within the last few weeks, a memoir, in which he has proved that the urine, bile, milk, as well as the other more important secretions in the lower animals, are formed within the nucleated cells of the gland ducts. He believes, therefore, that the urine of man is poured at first into the cavities of the nucleated cells of the human kidney.

In proceeding to describe the morbid changes which he had detected in kidneys, in the various stages of the granular disease of Bright, the author of the paper did not pretend to decide, whether these changes originated in inflammation, or simply in congestion of the gland. He reminded the society of those changes, which at a former meeting he had announced as occurring in the vesicular glands of the intestine during fever, namely, the formation and progressive increase of nucleated cells, (probably aberrant forms of the epithelium which line the vesicles,) within the vesicles of the patches. He now stated, that granular degeneration of the kidney was a similar decrease; that it consisted